F- 6862

Wardle, Sir Thomas [?]

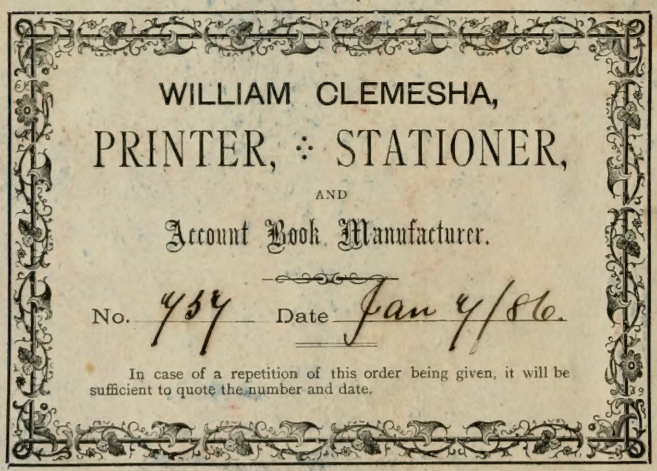
Absorbtions Spectra of Indian Dyes, 1886

Leek, Staffordshire, England

299 ff. Leather and Boards 34 x 24 cm.

1-21-64

Part of the Sir Thomas Wardle Papers.


WILLIAM CLEMESHA,
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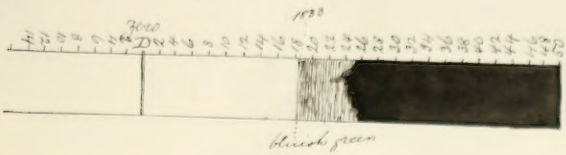
Thespesia populnea

Flowers.

Tulip tree. Ceylon and S. India.

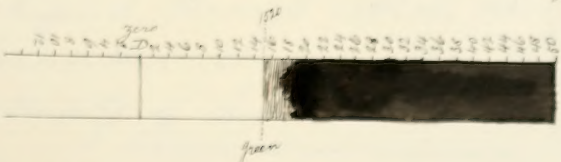
Aqueous infusion:-



With a moderately concentrated infusion shading of the spectrum begins at 1833 in the blush green and extends, gradually increasing in intensity as it proceeds, to the violet end of the spectrum.

By varying the strength of the infusion (or the thickness of the layer of liquid through which the light passes) the dark space is simply altered in extent and intensity.

Aqueous infusion containing alum:-



Shading of the spectrum begins at 1520 in the green, covering the whole of the spectrum to the right of this point and gradually intensifying as it proceeds towards the violet.

Varying the strength of the infusion merely alters the intensity of the shading

Bahakar

The dried leaves stems and seed vessels of a plant

Aqueous infusion :-

When the infusion was concentrated shading of the spectrum began at 1648 in the green gradually increasing in intensity & extended towards the right was becoming quite dark and remaining so to the violet end of the spectrum

Alteration of the strength of the infusion or of the thickness of the layer of liquid through which the light is transmitted simply alters the width and intensity of the dark space

---

Aqueous infusion containing alum

The spectrum appears exactly the same as when alum is not

Delphinium sp.

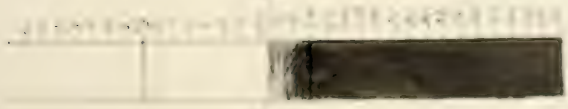
Esphanka falls. Ahmednagar.

Aqueous inclusions:—

When a moderately evaporated aqueous mass and shading of the spectrum begun at red on the blue gives gradually increasing in intensity towards the right and covering the whole or that part of the spectrum on the side of blue. Saturation of the constituents of the aqueous or of the chief one of the bigger the right which the light passes — by a view the extent and intensity of the band shading

---

Aqueous aqueous contains of the



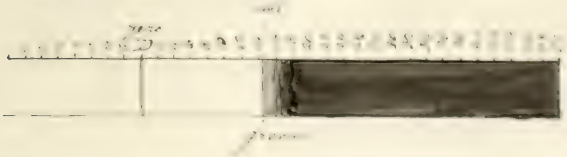
The spectrum has the same character as when not above and the shading will be further over the green portion

Saussurea camiallina.

Bark & roots

Cashmere, Nepal, The Himalayas.

c Aqueous infusion:—



When moderately concentrated shading of the spectrum began at 1445 in the green, gradually deepened towards the right and extended throughout the blue, indigo and violet. Variation in the thickness of the layer of infusion made variation in extent and intensity of the dark shading

---

c Alum (and other mordants) causes such a precipitation of the colouring matter from the infusion that it is useless to examine the spectrum with the dark

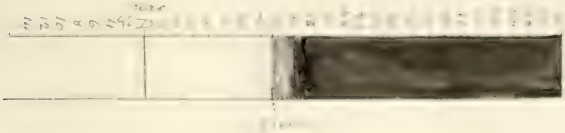
Nyctanthes arbortristis

(flowers)

Extract of the flowers

of

Aqueous infusion :—



There is scarcely any perceptible
reading of the spectrum beyond it ends
in the green gradually deepened as it
extended towards the right & when
it became quite dark and extended
as to the end of the spectrum.

Increasing the thickness of the
layer of liquid through which the
light is transmitted causes no change
in the extent and intensity of the dark
part.

Spirituous infusion [illegible]

The spectrum appears exactly the
same as when [illegible]

Callolus Philippinensis.

Red powder from the right capsules

Ha 4a

Seeds of the both West Provinces

Absorption spectrum —

Both a moderately concentrated solution the right portion of the spectrum is obscured. The shading commences at once on the green, gradually deepens & extended to the right over the whole dark and continuing on to the end of the spectrum.

Conclusion — the absence of the two of second channel probably indicates the salt and not only of the second part of the spectrum

Berberis tinctoria

(root)

Barberry wood.

The Nailgherries.

Aqueous infusion :-

Shading of the spectrum began at F 5/8 in the green gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum

Variations in the thickness of the layer of the liquid through which the light is transmitted only cause differences in the extent and intensity of the dark shading. As the layer becomes thinner the return to brightness is most manifest at the left of the dark shading and least so at the right the extreme violet being obscured with exceedingly dilute infusions. This remark refers to all the other spectra of this character

Aqueous infusion containing alum:

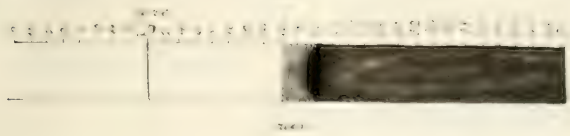
The spectrum appears exactly the same as when no alum is used.

Vitis labrusca Muderasputana.

(Seeds)

Hyson.

Alcoholic Infusion:



Shading of the colour began at once in the green, gradually becoming dark as it extended towards the right until it became quite dark brown, remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause differences in the extent and intensity of the dark shading.

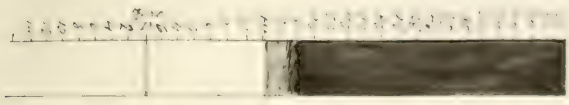
Aqueous infusions of these seeds are somewhat opaque and give shades of the same character as alcoholic infusions no appreciable difference being caused by adding alum

Chaikutha.

[illegible]

[illegible]

Aqueous infusion:—



[illegible]

The right end of the spectrum was obscured. The shading commencing at 411 — the green end gradually increasing in intensity until it became quite dark.

Variations of the thickness of the layer of liquid produce variations in the extent and intensity of the shading.

Aqueous solution containing alkali:—

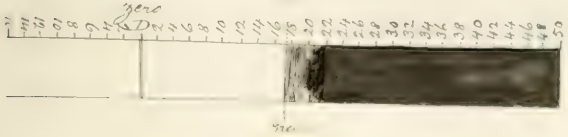
The spectrum appears the same as before, as when neutral.

Odina Wodier.

(Bark)

Coromandel Mountains, Bengal, Travancore.

Aqueous infusion:—



Shading of the spectrum began at 1731 in the green gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause differences in the extent and intensity of the dark shading.

Aqueous infusion containing alum:—

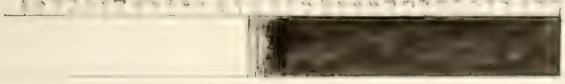
The spectrum appears exactly the same as when the alum is used.

Terminalia chebula

(Fruit, Myrabolans)

All parts of India

Aqueous infusion:



[illegible] the spectrum [illegible] gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted caused variations of the extent and intensity of the dark shading.

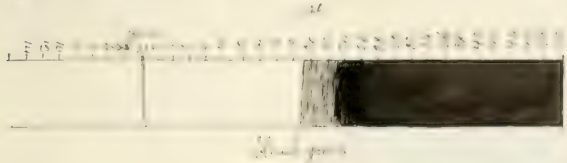
Aqueous infusion containing alum. The spectrum appears nearly the same as when no alum is used

Buchanania latifolia.

(Burk)

Gumma ? from Bombay Presidency

Aqueous infusion:—



Shading of the spectrum began at 1/10 in the bluish green, gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of the liquid through which the light is transmitted cause variations of the extent and intensity of the dark shading.

Aqueous infusion containing alum:

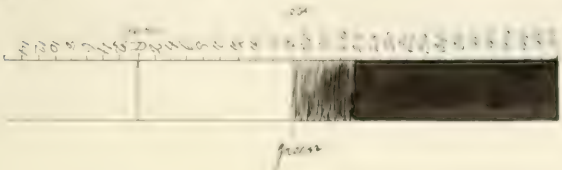
The spectrum appears exactly the same as when no alum is used.

Terminalia tomentosa

(Bark)

Malabar Coast, Oudh, N.W. Provinces etc.

Aqueous infusion:-



Shading of the spectrum began at F in the green gradually becoming darker as it extended towards the right, until it became quite dark and remained to the end of the spectrum

Variations of the thickness of the layer of liquid through which the light is transmitted causes variations of the extent and intensity of the dark shading

---

Alcoholic infusion containing about

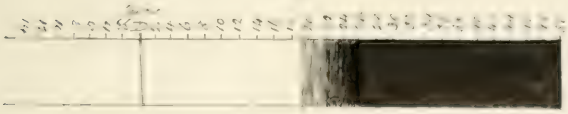
The spectrum appears the same as

Cedrela toona

(Bark)

Himalayas, Bengal, Mysore

Aqueous infusion. —



Shading of the spectrum begins at [illegible] & [illegible] gradually becomes darker as it extends towards the right until at [illegible] & [illegible] & remains so to the end of the spectrum.

Saturation of the whole of the length of liquid through which the light is transmitted causes [illegible] of the extent and intensity of the dark shading.

Alcoholic infusion. [illegible]

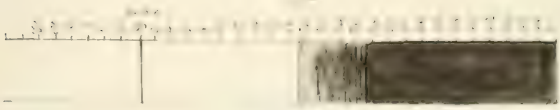
The spectrum appears exactly the same as when [illegible]

Terminalia alata

(Roxb.)

The Leaf.

A Specimen enlarged:



Shading of the specimen began at 1912 on the lower side gradually becoming darker as it extended towards the right — at its termination quite dark and terminated in the shape of the above figure.

Variation of the thickness of the layer of legend through which the light is transmitted causes variation of the extent and intensity of the dark shading.

A Specimen enlarged, showing shading.

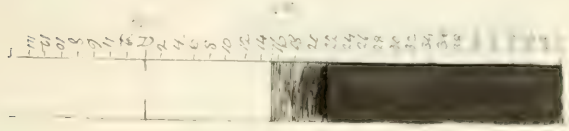
The specimen appears the same as the above one when viewed

Tamarix orientalis

Falls

The Punjab Peshawar

a Aqueous infusion



Shading of the absorption Spectrum of 540 on the green, gradually becoming darker as it approaches the end of the eight until it becomes quite dark and remained so to the end of the spectrum.

Examination of the thickness of the layer of liquid through which the light is transmitted causes variation in the extent and intensity of the dark shading

---

A aqueous infusion contains a glucoside which is precipitated or removed by the use of alum powder so that it is useless to examine the spectrum with this solution

Terminalia citrina

(Fruits & powder)

Stem

Aqueous infusion

shading of the specimen upon the 211th in the green particularly in covering darker on I extended towards the right and it has a pale dark and terminated as to the end of the specimen

Variation of the shadow of the Copper obtained through which the light is transmitted over variations of the result and density of the dark shading

---

Specimen exposure to burning charcoal

The specimen appears nearly the same as when

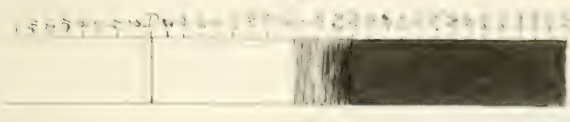
Caesalpinia coriaria

(Roots)

Dun dun

Madras Presidency

Aqueous infusion :-



Put a few of the specimen tops at 1.4 in the pure gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations — the thickness of the layer of liquid through which the light is transmitted causes variations of the extent and intensity of the dark shading.

Spirituous infusion — Coming after

The spectrum has the same characters as before as above is used but the shading instead of commencing at 1.4 — the pure [illegible] at the end of the yellow

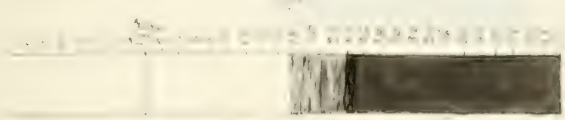
c Acacia Catechu

(Extract of wood)

Catechu.

The coat of Bombay

c Aqueous infusion —



Shading of the spectrum began at F in the green gradually becoming darker as it extended towards the right until at G it was quite dark and remained so to the end of the spectrum.

Conclusions — the thickness of the layer of liquid through which the light is transmitted is a measure of the extent and intensity of the dark shading.

---

c Aqueous infusion containing ab

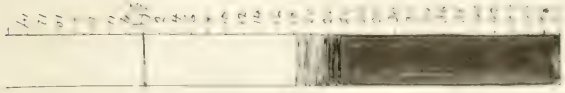
The spectrum appears exactly the same as when no ab is used

Cassia fistula

Roxb.

Bengal.

A leguminous tree:—



Shoot.

Shoot of the previous year with the bracts persistently clasping the base of it extended towards the right and it bears quite dark and compound leaves at the end of the shoot.

Leaves on the shoot of the year the larger of them through which the light is shown. Leaf scars on the petiole and internode of the dark shoot.

A leguminous tree of the Sundarbans. The shoots appear exactly the same as in other localities.

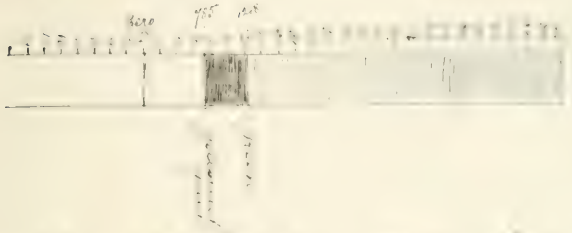
Caesalpinia sappan.

(Wood)

Sapan wood.

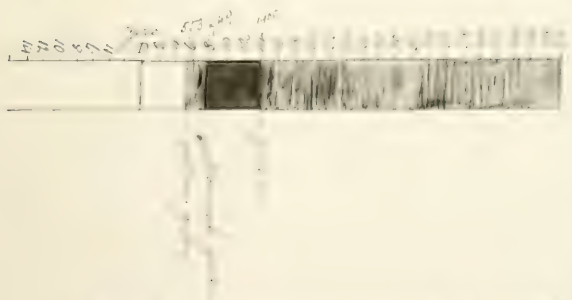
Local

1 Specimen in fine ... dry state



Part of bark from one of the pollard trees to which the specimen belongs. Bright dark brown about all on the surface & the wood of this band.

1 Specimen in fine ... dry state



1 ... specimen in fairly dry state. The yellow grain showing clearly with dark brown on the yellowish grain. It is described as a dark band from this point to next on the grain. Remove the specimen ... visible all along to pith rather rough finish. Colour to the left of 222 on the yellowish grain very bright

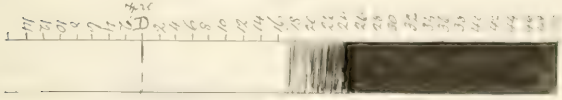
Continued on page 12

Butea frondosa

(Flame)

Alcoholic extract of the flowers.

Aqueous impression —



Shading of the spectrum begins at 1690 in the green gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

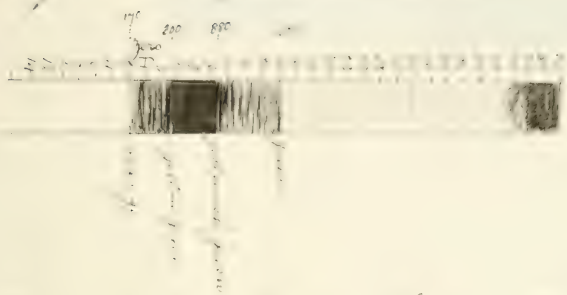
Variations in the intensity of the light as viewed through which the light is transmitted causes variations of the extent and intensity of the dark shading.

Aqueous infusion containing al-

The spectrum almost exactly the

Logwood

Haematoxylon campechianum.

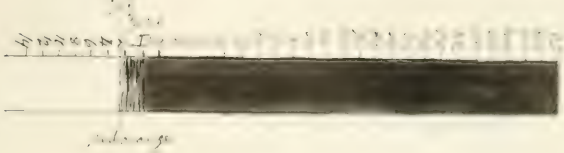


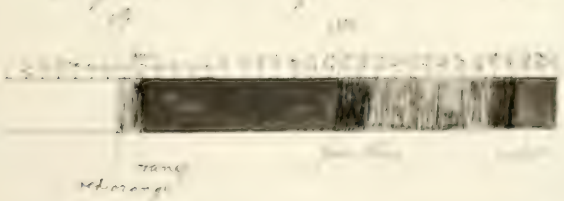
Very slight shading began at 170 in the orange which increased in darkness as it extended towards the right until it reached 300 in the yellow green. At this point it merged into a much darker portion which extended to 880 in the yellowish green where it became somewhat lighter & then gradually lighter until it reached 1600 in the green. From 1600 a faint shading extended to the violet end of the spectrum. To the left of 170 in the orange the spectrum is quite bright.

See following page for the spectrum of a more concentrated aqueous infusion

Logwood.

Continued from last page





With a moderately concentrated infusion shading commenced at 17 in the red orange becoming darker as it extended towards the right until it was quite dark at 20 & remained dark to 2304 in the green blue where the darkness began rather by sudden and continued so almost to the violet end of the spectrum where the dark was once again complete

Logwood.

Continued from last page

* Solution of green oxidized with sulphuric acid

green

shading of the spectrum begins at 111½ in the green, gradually becoming darker as it extended towards the right until it became quite black at about 90 to the end of the spectrum

Variations in the intensity of the tone of light and shade when the light is transmitted cause variations in the extent and intensity of the dark shading

---

* The green obtained by oxidizing logwood with chromic acid is a yellow colour and the absorption spectrum is like that of the majority of substances containing yellow colouring matters

Logwood

Continued from last page

Aqueous infusion made about with soda

Shading of the spectrum begins at 254 in the red orange and gradually becoming darker as it extended towards the right until it became quite dark at 189 in the green and remained so to the end of the spectrum

Variations of the thickness of the layer of liquid through which the light is transmitted produce variations in the extent and intensity of the dark shading

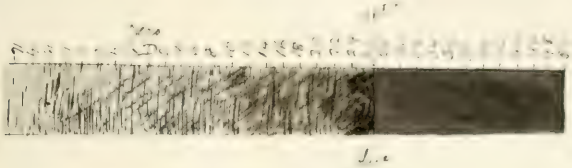
---

* This alkaline infusion has a purple colour and exhibits absorption somewhat of the character of cochineal (page 1) though in the latter the boundaries from light to dark are more sharply defined from left to right along the spectrum and more sudden

Logwood

Continued from last page.

[illegible] ferric sulphate.



Shading of the spectrum begins at the extreme red end gradually becoming darker as it extends towards the right until it becomes quite dark at 2652 in the blue and continued on to the violet end of the spectrum.

[illegible] the thickness of the layer of liquid through which the light passes [illegible] the intensity of the dark shading. The red end of the spectrum always being the light but the darkness gradually intensifying [illegible] with very dilute infusions the shading extends in the manner throughout the whole spectrum.

If the [illegible] ferric sulphate [illegible] the infusion a rather dull [illegible]

Logwood

Continued from last page

of ferrous sulphate mixed with chloride of tin.

Chloride of tin precipitates the colouring matter from the liquor and therefore an examination of the adulteration products is not of much use, but it may be mentioned that the character of this spectrum is similar to that of an aqueous infusion of logwood made alkaline with soda (page 29)

Logwood.

Continued from last page.

[redacted] with bichromate of potash.

[redacted] and maps.

Shading of the spectrum begins at 3[illegible] in the orange and gradually becoming darker as it extended towards the right — at D it was quite dark at 589 — the yellow green and remained so to the end of the spectrum.

Inference — the thickness of the layer of liquid through which the light passed causes variations in the extent and intensity of the dark shading

---

A solution (aqueous) of bichromate of potash when first examined by the spectroscope showed no absorption spectrum similar to chromates to the spectra obtained with extracts of substances containing yellow dyes, as for Example Butea frondosa flowers (page 24).

Emblica officinalis
or Phyllanthus emblica
(Fruit)

Southern Mahratta Country.

Aqueous infusion:

Shading of the spectrum begins at 1538 in the green gradually becoming darker as it extended towards the violet until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted make no material difference in the extent and intensity of the dark shading.

Coscinium fenestratum

(Gaert)

Colebr. — S. Indian Forests

Shading of the spectrum began at red — the blue-green gradually becoming darker as it extended towards the right until at [redacted] it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the dark shading.

Embryopteris glutinifera.

(Hunt.)

A broth of boiled leaves and bhangal

Spectrum of

Showing the spectrum began at 15 — the green gradually becoming darker as it extended towards the right until it became quite black and remained so to the end of the spectrum.

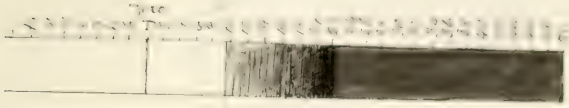
Variation of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading

Aegle Marmelos

(Pulp of fruit)

(Bengal Quince)

Bombay side of India.



Shading of the spectrum began at 985 in the green, gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum

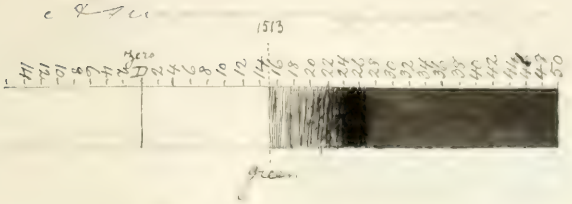
Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

c. *Artocarpus integrifolia.*

(Wood)

Jack tree

Vega Brown.



Shading of the spectrum begins at 1513 in the green, gradually becoming darker as it extends towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Bixa Orellana

(Linn.)

Arnotto

Prepared Myself

Alcoholic infusion

Shading of the spectrum to green at once in the green gradually becoming darker as it extended towards the right, until at b became quite dark and remained so to the end of the spectrum.

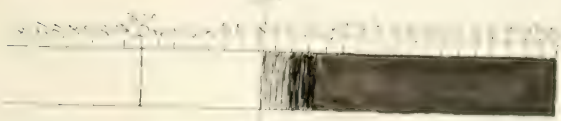
Variations of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the dark shading.

Jasminum grandiflorum

(Flowers)

Hyderabad.

Aqueous infusion:-



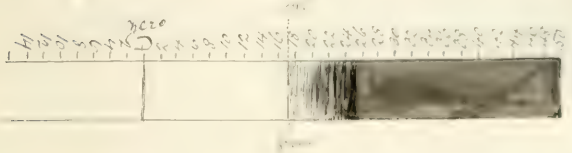
Shading of the spectrum began at 1421 in the green, gradually intensifying towards the violet and it became quite dark and remained so to the end of the spectrum.

Variations of the shadow of the layer of liquid through which the light passes causes variations in the extent and intensity of the dark shading.

Aqueous infusion + basic lead acetate + Alum (and other metallic salts) causes a dense precipitate, so that the absorption spectrum cannot be satisfactorily examined.

Jatropha glandulifera

Deccan, Northern Circars.



Shading of the spectrum began at 1713 in the green, gradually ~~extending~~ towards the right until it became quite dark, and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the dark shading.

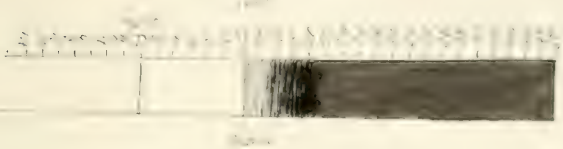
The spectrum appears exactly the same as when no alum is used.

Cerioph. Roxburghianus

Berk

Presidency of Bengal.

Aqueous infusion:—



Shading of the spectrum began at 1224 in the green, gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations of the extent and intensity of the dark shading.

Aqueous infusion containing alum.

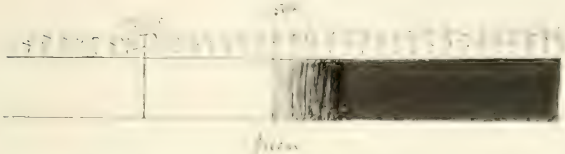
The spectrum appears exactly the same as when no alum is used

Conocarpus latifolius

(Leaves)

Inland Deccan Hills, Chittagong

Aqueous infusion :—



Shading of the spectrum began at 1562 in the green, gradually becoming darker as it extended towards the right, until it became quite dark — and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing alum—

Alum forms in the infusion a very dense precipitate, so that the absorption spectrum cannot be satisfactorily examined.

Other mordants have a similar effect.

Berberis Lycium.

(Wood)

Indian Barberry.

The Tomatoya

Aqueous infusion:-

Shading of the spectrum began at b.f. in the green, gradually becoming darker as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the dark shading

---

Aqueous infusion Evening observ.

The spectrum appears exactly the same as when the observ. was made,

Casuarina muricata.

(Bark.)

Bengal. All parts of the Deccan.

Aqueous infusion:—

Shading of the spectrum began at 11433 in the green, gradually becoming darker as it extended towards the right, until it became quite dark — & appeared so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations of the extent and intensity of the dark shading.

Aqueous infusion containing ...

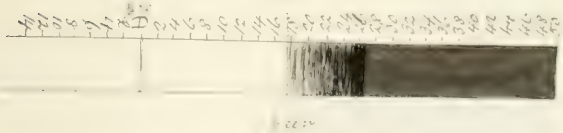
The spectrum appears exactly the same as when the water is used.

Citrus acida

(Fruits)

Shikarpur

Aqueous infusion:-



Shading of the spectrum began at 17½ in the green gradually becoming darker and extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the dark shading.

Aqueous infusion containing alum:-

The spectrum appears exactly the same as when no alum is used.

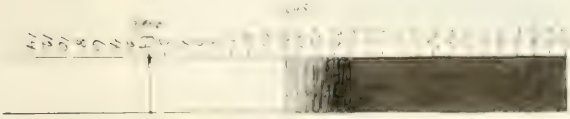
Rubia tinctorium.

(Root)

Madder.

All over India and Ceylon

Aqueous infusion.



Shading of the spectrum began at 164 ; the green gradually becoming darker as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the dark shading.

An aqueous infusion [illegible] the spectrum appears exactly the same as when the alcoholic extract is used.

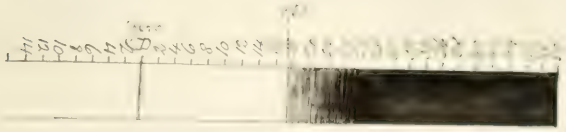
[illegible] on next page.

Rubia tinctorium

(Root)

Continued from last page

of aqueous infusion acidified with Sulphuric acid.



Shading of the portion Lyon of 1754 in the from gradually becoming darker as it extended towards the right until it became quite black and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light passed caused variations in the extent and intensity of the shading

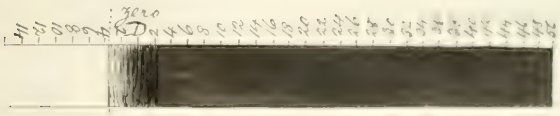
Continued on following page

Rubia tinctorum

(Root)

Continued from previous page

Aqueous infusion made alkaline with soda.



red orange

Shading of the spectrum begins at 360 in the red orange gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum

Variations in the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading

This spectrum is of the same character as that of Coccus cacti Lacc.

The same spectrum is obtained with an alcoholic as with aqueous extracts of madder

Rubia munjista

(Roots, stems and branches)

Indian madder

Aden. Aden Bombay

Specimens with cambial inclusions both alone and when treated with different reagents, gave absorption spectra exactly the same in character as those given by Rubia tinctorium (wild madder), pages 45, 46 and 47.

Quercus infectoria

(Galls)

A species of oak.

Various parts of Asia.

Aqueous infusion —

Reading of the spectrum began at 553 in the green, gradually becoming darker and extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

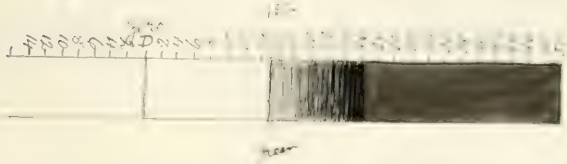
Aqueous infusion containing alum

The spectrum appears exactly the same as when no alum is used.

Quercus infectoria
(Bark)

A species of oak
Various parts of Asia

Aqueous infusion:-



Shading of the spectrum began at 1512 in the green, gradually becoming darker as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

Aqueous infusion containing alum:-

The spectrum appears exactly the same as when no alum is used, though it is made slightly dull in its light border owing to a little opacity in the infusion.

Quercus incana.

(Bark.)

An Indian oak.

Aqueous infusion

Shading of the spectrum began at 15 in the green gradually becoming darker as it extended towards the right, until at 6 it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing alum

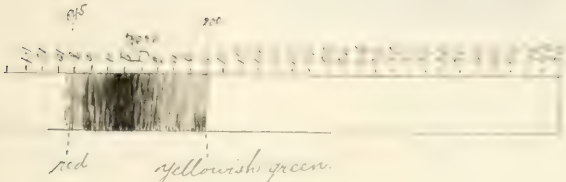
The spectrum appears exactly the same as when no alum is used.

Indigofera tinctoria

(Sulphate of indigo)

Extensively grown in India

Aqueous solution.



In the red at B the darkness had shaded to light or almost light

The darkness shaded to light from D to E in the yellowish green but the whole darkness on the right of D was not nearly so intense as on the left.

Probably the intensest darkness was at about D in the red orange.

There were no other bands or dark spaces in the spectrum.

Aqueous solution containing alum.

The spectrum appears exactly the same as when no alum is used.

In each case, variations of the thickness of the layer employed [illegible] did the light pass through the second solution — the colour and intensity of the dark bands

[illegible]

Indigofera tinctoria.

(Hyacinth nat)

Shading of the spectrum began at
D1 in the green gradually increasing
in intensity until, further to the right,
it became quite dark after which
no more of the spectrum was
visible in that direction

Saturation of the shade
of the layer of liquid through
which the light was transmitted
caused variation — the intensity
and density of the shading

The spectrum of the Indigofera tinct
has the same in character except that
a very faint band appears on
the yellow green

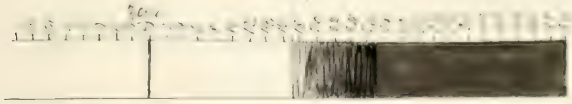
Curcuma longa.

(Roots)

[illegible]

All over India.

Aqueous infusion



Shading of the spectrum began at 1719 in the green, gradually becoming darker as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light passes cause variations in the extent and intensity of the dark shading.

Aqueous infusion. Containing [illegible]

The spectrum appears exactly the same as when no alum is used.

Curcuma zedoaria.

(Roots)

Long-leaved Turmeric.

Bengal Chittagong

Aqueous infusion:-

Shading of the spectrum begins at 1764 in the green, gradually becoming darker as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the dark shading.

Aqueous infusion containing alum.

The spectrum appears exactly the same as when no alum is used.

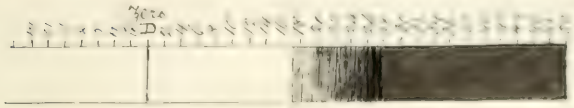
Curcuma tinctoria

(Roots)

Turmeric

India.

Aqueous infusion:-



Shading of the spectrum began at 1/32 in the green, gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum

Variations in the thickness of the layer of liquid through which the light is transmitted caused variations in the extent and intensity of the dark shading.

Aqueous infusion containing alum:

The spectrum appears exactly the same as when no alum is used.

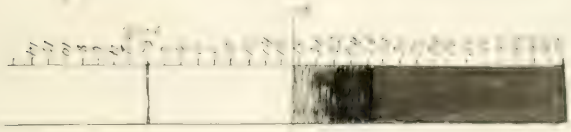
Curcuma aromatica.

(Roots)

Turmeric

India

Aqueous infusion.



Shading of the spectrum to begin at 1788 in the green, gradually becoming more intense as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing alum.

The spectrum appears exactly the same as when no alum is used.

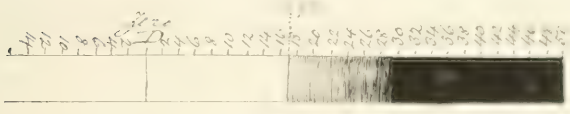
Curcuma amada

(Roots)

Mango ginger

Gujerat, Concan, Bengal, Sama

Aqueous infusion.



Shading of the spectrum
began at B-2 in the green
increasing in intensity as it
extended towards the violet
until it was cut off
remaining dark to the end of
the spectrum.

Variations in the shading
of the lower of liquid through
which the light is transmitted
cause variations in the width
and intensity of the shading.

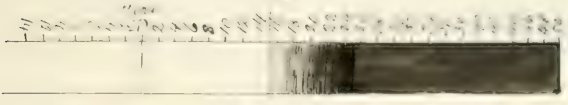
Aqueous infusion contains
the spectrum appears exactly
the same as when the above
used

Hymenodyction excelsum.

(Bark)

Neilgherries, Circars.

Aqueous infusion:-



Shading of the spectrum began at the green gradually becoming more intense as it extended towards the violet until it became quite dark and remained so to the end of the spectrum.

Quantity of solution of the bark of Cupania [illegible] reduced the light to [illegible] without any marked alteration in the width and intensity of the shading.

Aqueous infusion containing alum:

The spectrum obtained exactly the same as with a solution of alum.

Hedyotis umbellata.

(Roots)

Chay root

The Coromandel Coast.

see page 111

Shading of the specimen begins at right in the form gradually becoming more intense and extended towards the right, until it became quite dark and remained so to the end of the specimen.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Specimen infected [illegible] with the adventitious appearance exactly like the same [illegible] as used

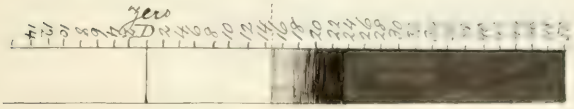
Helicteres Isora.

(Capsules)

Screw plant.

India

Aqueous infusion.



Shading of the spectrum from D to E. The green predominates more in the red and towards the right until it becomes quite dark and is cut off at the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted make no variations in the extent and intensity of the shading.

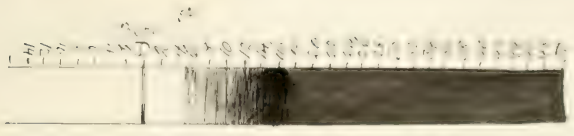
Aqueous infusion shading the same. The specimen apparently the same as the above used.

Holdi

(a woody root)

India

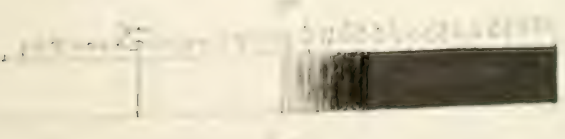
Aqueous infusion –



Reading of the scale before adding 321 in the volumetric flask, becoming [illegible] towards the right until it became quite dark with reference to the end of the scale.

Reading of the scale when the layer of liquid [illegible] the light is [illegible] in the volumetric flask by the reading

Aqueous infusion containing [illegible]



Reading of the standard [illegible] the same [illegible] the standard [illegible] the same [illegible]

2 of

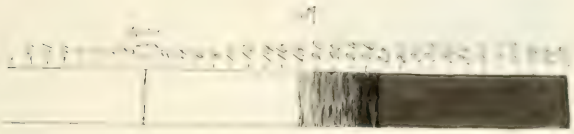
Semecarpus anacardium.

(Fruits)

Marking nut tree

Madras Presidency, Skirts of the Bombay forests, Berar, Assam

Alcoholic infusion:-



Reading of the spectrum taps at 1809 on the green, gradually becoming more intense as it extended towards the violet until it became quite black and remained so to the end of the spectrum.

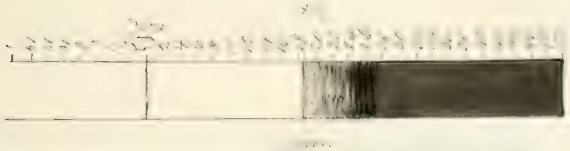
Examination of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the absorption.

3 Carpinus duriusculata.
(Fruits.)

Cap nut tree

The peninsula of Indian Bengal.

Absorbtion spectrum:



Shading of the spectrum began at F in the green, gradually becoming more intense as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Examination of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading

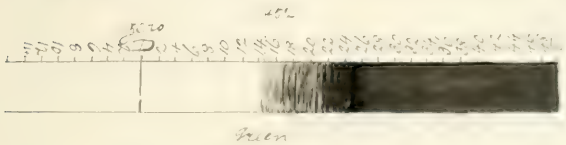
Cassia tora

(Seeds)

Tarota seeds, Tarbyjan seeds

All over the plains of India and in Ceylon.

Aqueous extract:



Shading of the spectrum begins at 1452 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Increasing the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading.

Aqueous infusion containing alum:-

The spectrum appears exactly the same as when no alum is used.

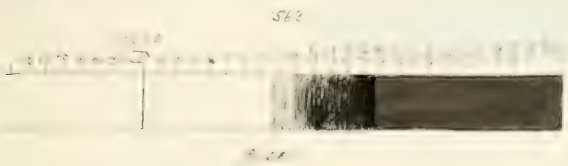
2. *Ficus infectoria*

(Galls)

Wave leaved fig tree

Ceylon and the peninsula of India

a. Aqueous infusion:-



Shading of the spectrum began at F. the gray gradually increasing in intensity as it extended towards the right, until it became quite dark and remained so to the end of the spectrum-

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

---

b. Aqueous infusion containing alum-

The spectrum is exactly the same as when no alum is used.

Ficus religiosa.

(Leaf)

Final [illegible]

A list of the [illegible] of the [illegible] of Ficus

[illegible]

Shading [illegible] of [illegible] Hydrogen
at 1604 in the [illegible] gradually
increasing in intensity as it
extended towards the right until
it became quite dark [illegible]
as to the end of the spectrum.

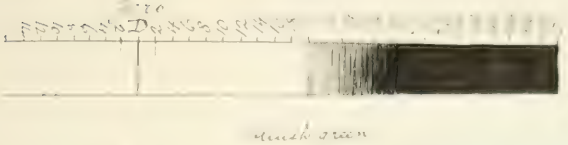
Fraunhofer's [illegible] of the [illegible]
[illegible] of [illegible] [illegible] called
H. Light is [illegible] [illegible]
variations of the [illegible] and
intensity of the shading.

[illegible] appears in the [illegible]
The spectrum appears as [illegible] of
[illegible] as when no slit is used

Bhauri. Leaves.

Jungles of India.

a Aqueous infusion



Shading of the spectrum began at 1987. in the bluish green, gradually becoming more intense as it extended towards the right until it became quite dark and remained so to the end of the spectrum

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of this shading

---

a Aqueous infusion containing alum

The spectrum appears as in the same as when the alum is used

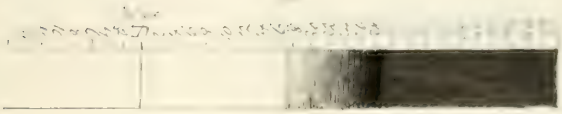
Bandia in perfumed

Lard

Mountain Ebony

Cuba, Vedam, with [illegible] of Cuba

Specimen specimen



Reading of the absorption began at 1705 in the green gradually increasing intensity as it extended towards the violet end of the spectrum with dark and narrow lines to the end of the spectrum

Variations of the thickness of the layer of liquid through which the light is transmitted causes variations in the width and intensity of the bands

Aqueous infusion [illegible]

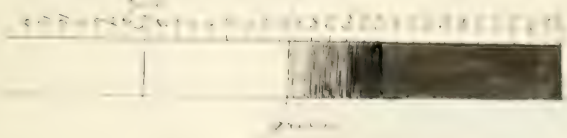
The spectrum appears exactly the same as when the [illegible]

Brachinia conjuncta

(Dej.)

Madras Coast
India Bay of Bengal at Ganjam

Spectrum of



Shading of the spectrum begins at 130 in the green gradually becoming darker as it extends towards the right until at 140 it ends suddenly and remains so to the end of the spectrum.

Examinations of the absorption of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Spectrum of

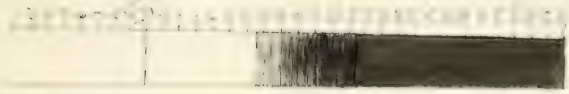
The spectrum appears exactly the same as when the solution is used

Calotropis gigantea.

(Bark)

Gigantic swallow-wort

all parts of India



Shading of the spectrum beyond 30 on the green, gradually increasing in intensity as it extended towards the red until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light passes cause variations in the extent and intensity of the shading.

Aqueous infusion

The spectrum appears exactly the same as when the solution is used.

Cassia auriculata

(Roxb)

Common name

Madras Presidency, the Deccan

Reading - the spectrum began at 1411 in the green, gradually increasing in intensity as it extended towards the right until it became [illegible] and remained so to the end of the spectrum

Concentration - the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the dark shading

---

Aqueous infusion Critical value

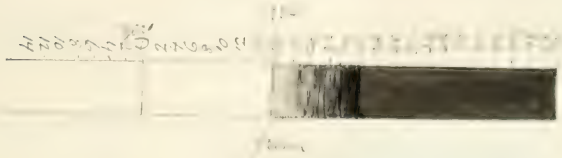
The spectrum appears exactly the same as when the alcoholic extract

Gustum sai.

Ext. black herbaceous plant

Tane. Hill.

Aqueous infusion.



Shading of the spectrum began at 1552 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light was transmitted cause variations in the extent and intensity of the shading.

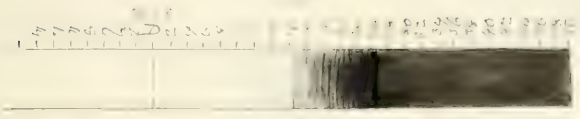
Aqueous infusion combining with the spectrum appears exactly the same as when no alkali is used.

Gyrita tomentosa.

(Leaves)

Nearly Genuine.

Every part of the Continent of India.



Reading of the spectrum
very dark in the green, gradually
becoming more intense as it
extended Towards the right
until it became quite dark and
remained so to the end of the
spectrum.

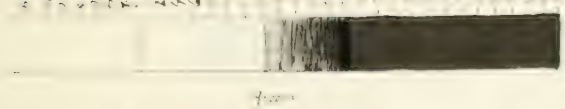
Variations of the thickness of
the layer of liquid through which
the light is transmitted pro-
duces no effect upon the
intensity of the shading

Grisea tomentosa

(Flowers)

Shelf Grisea

Every part of the Continent of India



Caesalpinia sapphan.

Wood

Sapan Wood

Angot

(in sup. 3)

Aqueous infusion containing ab.

orange yellow gre

Shading of the spectrum begins at 1414 in the orange gradually increasing in intensity as it extended towards the right covering part of the at 1311 the yellow green and ... to the end of the spectrum.

The whole portion to the left of 1414 in the orange was quite bright

When a much thinner layer of liquid was examined than that which gave the above spectrum the blue and indigo bands of the spectrum seemed slightly less obscured than the green but this was only at one particular point in the thickness of the layer of liquid ... the exception variations of the thickness of the layer of liquid through which the light was transmitted only caused variations in the extent and intensity of the shading.

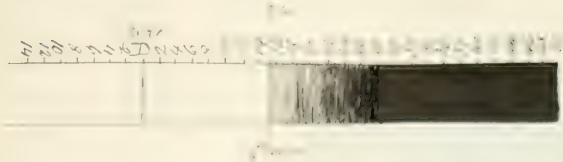
(continued on page 75)

Pterocarpus marsupium.

(Bark.)

Strength [illegible] *Alcoholic*

Aqueous infusion.



Shading of the spectrum begins at 15½ in the green [illegible] increasing in intensity as it extended towards the right, until it became quite dark and remained so to the end of the Spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion [illegible]

The spectrum appears exactly the same as when the alcoholic is used.

Punica granatum,

(Rind of fruit)

Aqueous infusion

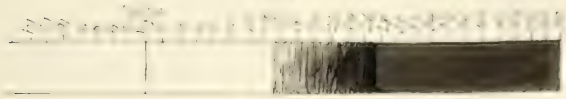
Reading of the spectrum begins at 1589, in the green, gradually increasing in intensity as it extended towards the violet until it became quite dense and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing about 1 Gram extract in 100 c.c. water.

Solution of Potassium bichromate in the infusion, used as reagent to it useful to examine the absorption spectrum.

Kauma Lark



Shading of the spec[illegible]
open at 1530 in the green gr[illegible]
increasing in intensity as it
extended towards the right and
it became quite dark [illegible]
er to the end of the spectrum

Variations of the thickness of
the layer of liquid through which
the light is transmitted cause
variations in the extent and
[illegible]ness of the shading

[illegible] examined [illegible]

The spectrum appears exactly
the same as when the above
is made.

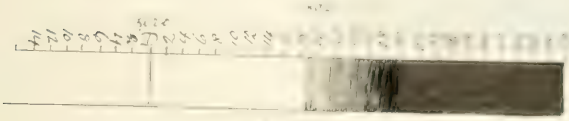
Euphorbia tirucalli

Linn. Spec. Plant.

Rheede Hort. Mal. Vol. 9. p. 19.

Bombay Presidency

Specimen imperfect.



Shading of the shoots begins at 20 on the third joint gradually becoming more intense as it extends towards the right until it becomes quite dark and remains so to the end of the shoot.

Variation of the thickness of the lines of shading with the light in front and behind more numerous on the outer side of the shading

Specimen imperfect. Shading gradually the same on both sides of the shoot

Acacia Arabica

(Bark)

Used for

Tanning Leather and the Persian

Acacia Arabica

Leading to the conclusion
began to appear the moon, gradually
increasing in [illegible] as it
extended towards the right until
it became quite dark and remained
so to the end of the operation

Variations of the thickness of
the layer of liquid through which
the light is transmitted cause
variations in the color and
intensity of the final shading

Acacia arabica [illegible]
[illegible] effects [illegible]
the same as [illegible] when
used

Tahn Lee

Aqueous infusion

Aqueous infusion of [redacted]

Shading of the spectrum began at 1430 on the green gradually extending towards the right, until it became quite dark and remained so to the end of the spectrum

Variations in the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading

---

Aqueous infusion containing alum:-

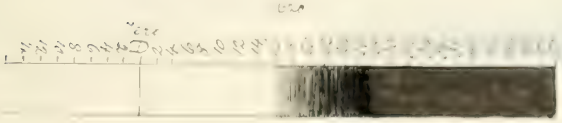
The spectrum appears exactly the same as when no alum is used

Eugenia jambolana

(Bark)

c Madras [illegible]
Gumsur, Bengal Kennedy

c Aqueous infusion:-



Shading of the absorption begins at b 2 on the green gradually increasing in intensity as it extends towards the violet ends at F where it is quite dark and remains so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light passes [illegible] in the extent and intensity of the shading.

---

c Aqueous infusion containing alum.

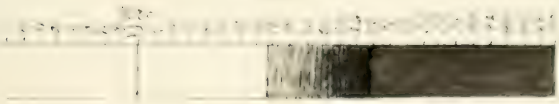
The spectrum appears exactly the same as when the alum is not used.

- Cut Solid

(of Cylinder plus)

Hyperboloid

Spectrum appearance -



Flame

Flame is the result of the ignition of gases at 1870 in the presence of oxygen. The burning gas is ionized by the electrical field and the light is emitted. It becomes part of the spectrum.

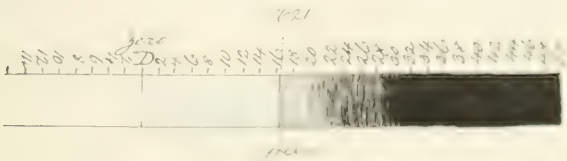
Examination of the shadow of the cone beyond the angle where the light is transmitted causes variations in the width and intensity of the shadow.

Spectrum appearance continued

The electron sphere is nearly the same as when the atom was made.

Caesalpinia Sappan
Wood
Extract
of Bengal

Aqueous infusion containing sulphuric acid:—



Shading of the spectrum began at 1621 in the green gradually increasing in intensity as it extended towards the right until it became quite dark remaining so to the end of the spectrum.

Variations of which are of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Continued on following page

Caesalpinia sappan

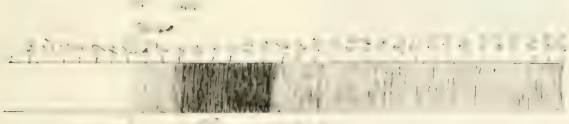
(Wendl)

Sapan wood

Dye

Extracted from heartwood

Debile specimen in fruit collected by
Roda:-



Petal shading of the specimen
began at the margin and
gradually increased in intensity
until it reached red on the
yellow green ground colour
moderately with reflexed lamina
Commenced and extended over most
of the green portion of the specimen
at the right of the band the
specimen was partly stained
throughout. On the top of the
the margin the specimen stained
deeply bright.

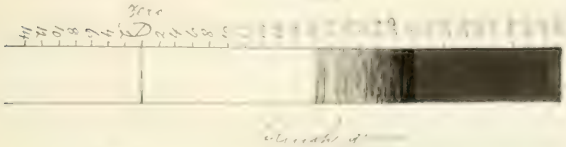
Continued to page 41

Rhus kakrasingiana

Cuba

Cienaga, outlet — on the [illegible] type
valleys of the interior of Pinar

Aqueous infusion:



Shading of the spectrum began at 2042 in the bluish green gradually increasing in intensity as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light was transmitted caused variations in the extent and intensity of the shading.

Aqueous infusion containing alum.

Alum (and other mordants) causes such a precipitation of the colouring matter that it is useless to examine the spectrum with this addition.

Morinda citrifolia

(Root)

Broad band of Morinda

Total Absorption of Violet and Blue
Green and Yellow

Specimen in powder

Shading of the spectrum began at 1200 in the green gradually increasing in intensity as it extended towards the right until it became quite dark and terminated at the end of the spectrum.

Variation in the thickness of the layer of liquid through which the light passes causes variations in the extent and intensity of the shading

---

Specimen in powder in boiling alcohol

Absorption spectrum identical exactly the same as when the solvent is water

Morinda lanceolata

(Rind of root)

Bengal

Shading of the specimen begins at 1mm in the pore gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the specimen.

Variations in the thickness of the layer of lignin through which the light is transmitted causes variations in the extent and intensity of the shading

---

Specimen appears uniformly white

The specimen appears exactly the same as when viewed

Morinda tinctoria

(Root)

Common on every part of India

Aqueous [illegible]

Shading of the spectrum began at 1802 on the green gradually increasing in intensity as it extended towards the violet, until it became quite black and remained so to the end of the spectrum

Evaporation of the shadow of the top of liquid through which the light is transmitted [illegible] intensity of the shading

---

Aqueous infusion containing alum

The spectrum appears exactly the same as under the reagent used

Chloride of

Lead

Iodide

Spectrum

Reading of the spectrum began at 1445 in the green gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

Aqueous injection containing

The spectrum appears exactly the same as when the solution is used

c Morinda micrifolia

(Lodd)

Of Hooker

c Species Indica —

[redacted]

Shading of the specimen upon at 1398 in the gen gradually increasing in intensity as it extended towards the right until it became quite black and remained so to the end of the specimen.

Variation of the thickness of the lines of injured thought which the light is shown to cause variations in the extent and intensity of the shading

c Species Indica, Smithsonian Museum

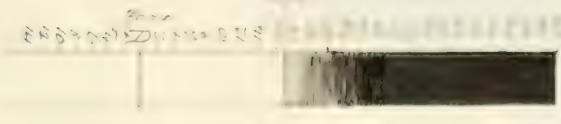
The characters of the specimen exactly the same as in the specimen

Symplocos racemosa

(Roxb)

A hydroalcoholic extract of the leaves of Symplocos racemosa (Roxb) was prepared by the method described in Pharmacopoeia of India. The extract was evaporated to dryness and the residue was dissolved in water to obtain a 1% solution.

A spectrophotometer was used to measure the absorbance of the solution at different wavelengths. The absorbance was measured at 1 nm intervals from 200 nm to 800 nm.



The absorbance was found to be maximum at 254 nm and then decreased gradually with increasing wavelength. The absorbance was found to be minimum at 800 nm and remained constant thereafter.

The absorbance of the solution was found to be directly proportional to the concentration of the extract in the solution. The absorbance was also found to be directly proportional to the thickness of the layer of the solution through which the light was transmitted.

The absorbance of the solution was found to be maximum at pH 7 and decreased on either side of pH 7. The absorbance was found to be minimum at pH 2 and pH 12.

The absorbance of the solution was found to be maximum at 25°C and decreased with increasing temperature. The absorbance was found to be minimum at 60°C.

The absorbance of the solution was found to be maximum in the absence of any other substance and decreased in the presence of other substances.

Terminalia Belerica.

(Fruits)

Belleric myrobalan

Tropical peninsula of India, Togo

Species in Russia

Spectrum of the spectrum Togo,
at 1:1 on the green, gradually
extending towards the right
and becoming dark at its
extended until it turns pale
dark and remained so to the end
of the spectrum

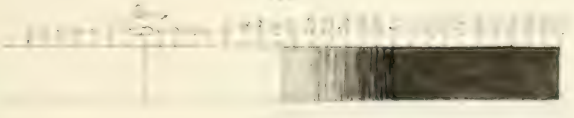
Variations in the thickness of
the layer of liquid through which
the light is transmitted
produce no effect on the position
or intensity of the shading

Aqueous infusion containing alum
The spectrum appears exactly
the same as when the alum is used

Kurzgack

Food

Aqueous infusion.



Shading of the spectrum began at 1680 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

Aqueous injection containing alum

The spectrum appears exactly the same as when no alum is used.

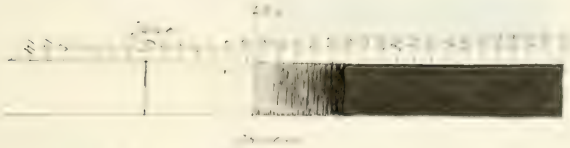
Terminalia angustifolia.

(Fruit)

Terminalia

T. H. Wenzell.

Aqueous infusion



Shading of the spectrum began at 1284 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

The thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading.

Aqueous infusion containing alum.

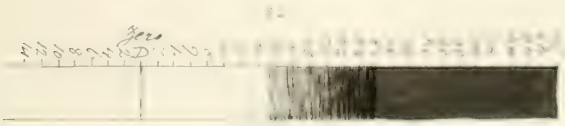
The spectrum appears exactly the same as when no alum is used.

Phumbaba Ki Thal

(Back)

Coit...

e of gucous infusion:-



Shading of the spectrum began at 15 21 in the green gradually increasing in intensity as it extended towards the right — at it became quite dark and remained so to the end of the spectrum.

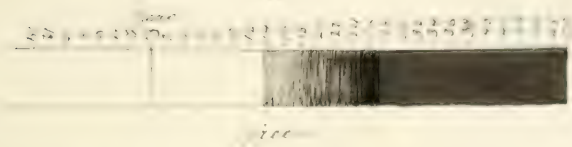
Variations of the thickness of the layer of liquid through which the light is transmitted, cause variations in the extent and intensity of the shading.

Gucous infusion containing alum

The spectrum appears exactly the same as when no alum is used.

Loranthus longiflorus.
(Desf.)

The Punjab Himalaya.



Shading of the spectrum begins at 1382 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion contains only alum.

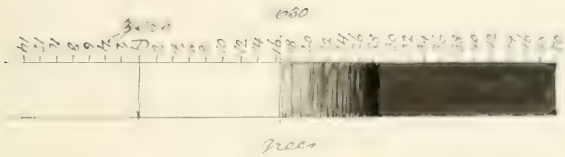
The spectrum appears exactly the same as when the chloride is used.

Necessary Clay

(Cont'd)

Pegu

Aqueous infusion:-



Shading of the spectrum began at 1630 in the green gradually increasing in intensity as it extended towards the violet until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

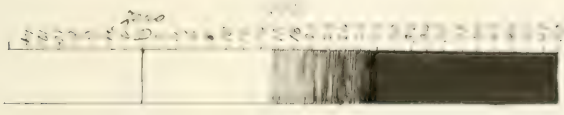
Aqueous infusion containing alum:-

The spectrum appears exactly the same as when no alum is used.

Vesuvius Lyc.
(Cook)

Lego

Aqueous infusion.



Shading of the spectrum lego. at 1/2 in the green, gradually increasing in intensity as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

Aqueous infusion containing alum

The spectrum appears exactly the same as when no alum is used.

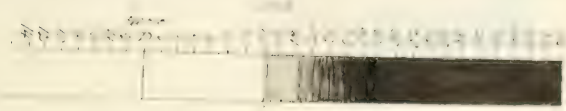
Lawsonia inermis.

(Lead)

Henna. Upper chest

All over India

Aqueous infusion



Red

Shading of the spectrum began at 1423 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading.

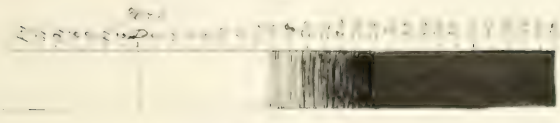
Aqueous infusion on burning also

The spectrum appears exactly the same as when no alcohol is used.

Iris

Dadhur, S. Kanara

Aqueous infusion



Shading of the violet begins at 15% in the green gradually increasing in intensity as it extended towards the right end it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading.

Aqueous infusion containing alum.

The spectrum appears exactly the same as with the plain water used.

Rasum Leti

(Leaves)

India.

Equivalent focus.

Reading of the spectrum began at 17.11 on the green, gradually increasing in intensity as it extended towards the right, until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted. Causes variations in the extent and intensity of the shading.

Equivalent focus. Reading of absorption

The spectrum appears exactly the same as when no alum is used

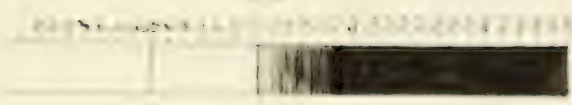
Zygophyllum fabago

(Linné)

Zygophyllum fabago Linné. Leaves of *Zygophyllum*

fabago Linné. Leaf tube and capsule

by cross section.



Shading of the epidermal layers of cells on the green gradually increasing in intensity as it extended toward the right until it becomes quite dark and terminated as to the end of the section.

Interstices of the chambers of the layer of liquid through which the light is transmitted causes variation of the color and intensity of the shading.

Epidermal cells of the upper surface of the leaf.

The epidermal appear exactly the same as the lower surface of leaf.

Nephtis Victoria

(Rock)

Upper Magdalena

Conductor, Godoway and the
Crew of the Madam Pomeroy in
all the forces of Bombay

[redacted]

[redacted]

Whereas by the Statutes in force
at the Port of Bombay it is
provided that no Vessel shall
be at liberty to depart the Port
until all Customs Duties shall have
been paid up to the end of the
preceding Month

Now we the Undersigned Owners of
the Barque of Liquid Ballast called
the Nephtis do hereby declare that
no Duties are due by us to the
Government of the Colony

Continued on following page

Wrightia tinctoria

(Roxb.)

Continued from preceding page

a 1 per cent infusion containing alum;

shading

shading of the spectrum began at 510 m.m. the red orange gradually becoming darker as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

This infusion with alum is a deep red colour & its spectrum is much like that of cochineal

See page 1

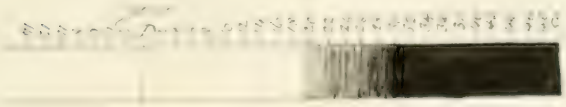
Thespesia populnea

(Calyces and Capsules)

Leaf Co.

Ceylon and S. India.

Aqueous infusion —



Shading of the spectrum begins at (D) — the third green predominates — shading is uniformly as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

Spirituous infusion Containing chlorophyll

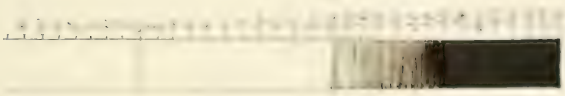
The spectrum appears exactly the same as when the solvent used

2 Butea frondosa
(Roxb.)

Makwa Tree.

The mountainous parts of the Konkan Bengal the Deccan South Carolina Konkan in Malwa Khandesh Gujarat.

Spectrum of flower —



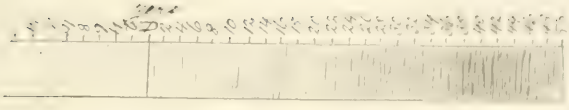
Reading of the spectrum begins at 32.5 in the green. Very faintly continuous up to 27 or 26 at extreme red. The right end of the spectrum is dark and continued up to the end of the spectrum.

Examination of the absorption of the sepals of fresh flowers showed the light to be transmitted [illegible] to the extent mentioned in the reading.

Spectrum of flowers containing colouring matter appears to be exactly the same as [illegible] the colour of which

Pistacia terebinthus.

(Tuft)

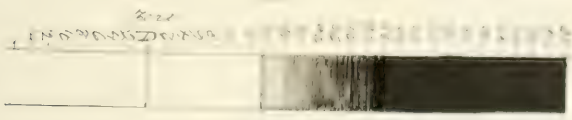


Pinus excelsa.

(Bark)

Narambetty, Nehal Tanta Bootan, Simmoor, Spartinal Kaphan Murree.

Aqueous infusion :-



Reading of the spectrum began at 1362 in the green gradually increasing in intensity it extended towards the right as it became quite dark, and so to the end of the violet.

Increase in the thickness of the layer of liquid through which the light is transmitted causes an increase in the intensity of the shading.

Aqueous infusion containing alum.

The spectrum has the same bands as when no alum is used but shading instead of commencing at 1362 in the green, commenced at 1412 in the green

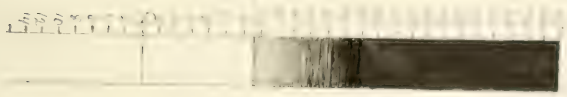
Pinus longifolia

(No. 6)

Long-leaved fir.

Kaghan, Himalaya, Chopal Cherce pass, Sonse and Jumna river, Sutlej valley

Aqueous infusion:-



Shading of the spectrum at 1314 in the green gradually increasing in intensity as it extended towards the violet, until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing alcohol.

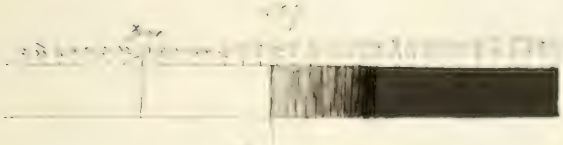
The spectrum has exactly the same character as when no alcohol was used but the shading instead of commencing at 1314 on the green does not set in till on the green.

Hemerocallis citrina

(Baroni)

India.

Flowers infundibuliform



Stamens & the apex
recurved & the pistil gradually
increasing in length as the
petals fade & become quite dark
and remain so to the end of
the flowering

Capsule oval obtuse
3 celled loculicidal many seeded
Seeds oval angled & black
Root tuberous

Flowers infundibuliform sweet scented yellow

The specific differs mainly in the colour of the flowers & the shape of the seed.

Melia azedarach

(Neem)

Common tree in North of India

Aqueous infusion —

[redacted]

Shading of the spectrum beyond the green, gradually increasing in intensity — extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

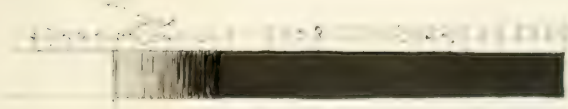
Aqueous infusion containing alum. The spectrum appears exactly the same as when no alum is used.

Mimosa siliqua.

(Bark)

1 lb. Bark

Aqueous infusion



red

Shading of the spectrum began at D1 in the red gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing alum.

So great a precipitate is caused by the use of alum and other mordants that it is useless to examine the absorption spectrum with this addition

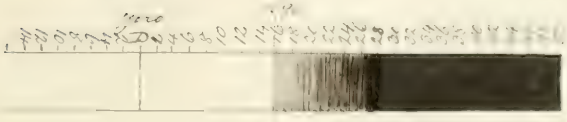
Plumbago zeylanica

(Roots)

White Lead mull

Evaporation to dryness

Aqueous extraction



Shading of the spectrum begins at 596 in the green, gradually increasing in intensity as it extended towards the violet end it became quite dark and remained so to the end of the spectrum

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

Aqueous infusion containing chlorides

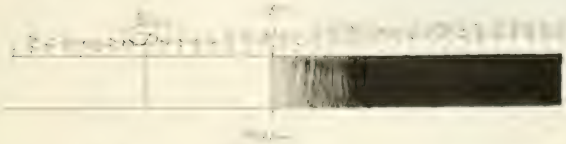
The spectrum appears exactly the same as when no chlorides are used

Pentaptera arjuna.

(Bark)

A common jungle tree. Bark forms of Burma.

Aqueous extract —



Reading of the spectrum began at red and the green gradually increasing in intensity as it extended towards the violet until it became quite dark and terminated so as to the end of the spectrum

Examination of the absorption of the layer of liquid through which the light was transmitted revealed a broad band in the red and indications of the shading

---

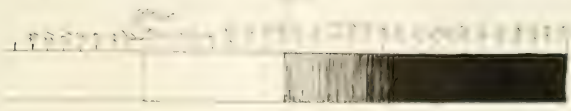
Aqueous extract containing chloride

The spectrum differs exactly the same as before the addition of acid

Mao Antiques

(Gaila)

India.

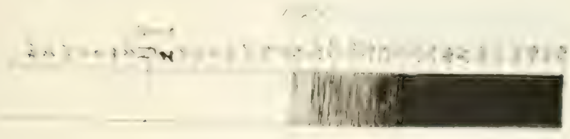


Symplocos racemosa

(Leaves)

Nepaul, Kumaon, Burdwan, Midnapore in Bengal, Kotah jungles, jungles of the highest ghauts of the Bombay Presidency

Aqueous infusion.



The shading of the spectrum began at [illegible] in the green, gradually increasing in intensity as it extended towards the right until it became quite dark and remaining so to the end of the spectrum

Variations of the thickness of the layer of liquid through which the light is transmitted, cause variations in the extent and intensity of the shading

Aqueous infusion containing alum.-

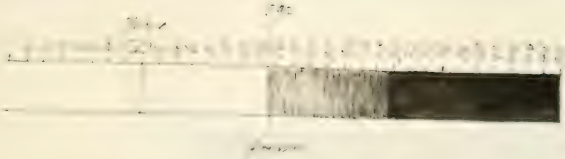
The spectrum appears exactly the same as when no alum was used.

Green Cover

(Cover)

Found in Encephalon & Retina
Pia Mater and Choroid Coats

Microscopic appearance



Shading of the spectrum begins at 1858 on the green gradually increasing in intensity as it extended towards the right until it became quite dark at 1900 remaining dark to the end of the spectrum.

Explanation of the shadows of the bands of liquid through which the light is transmitted Cause variations in the extent and intensity of the shading

Continued on following page

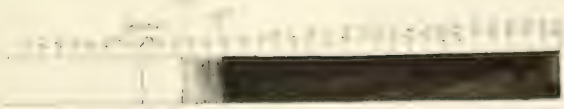
Coccus lacca

Kerr

Found on Ficus religiosa, Pithecolobium dulce, Ficus glomerata and Albizzia procera

Continued from preceding page

Specimens on dried adhering twigs



Shading of the specimens began at once in the yellow green gradually intensifying and extending at extended towards the right until it became quite dark at first on the crown after which spread over more of the specimens and finally towards the right

Evacuation of the abdomen of the bugs of liquid through which the light is transmitted causes variations in the extent and intensity of the shading

Continued on following page

Coccus lutea

(Kut.)

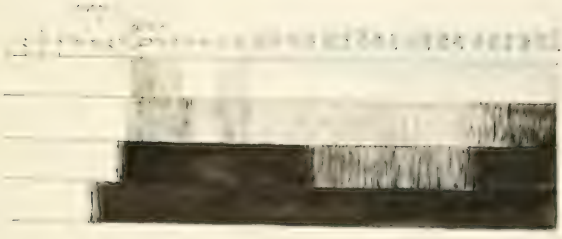
Found on [illegible] subgenus Robinia

Pseudacacia Linnaeus [illegible]

[illegible] [illegible] [illegible]

Specimens on both sulphurous and

acidic substrates with acids.



These two solubilities appear are

attributed by causing successively

thicker layers of the supernatant

to be [illegible] produced by the

thermal [illegible] and [illegible] by the

chemical [illegible].

Lopnida fibrifuga
(Bark)

The Coimbatore and Cuddapah districts, Godavery forests, Rajahmundry Circars, Chunar Hills, jungles to the south of Bagar [illegible] ft

Aqueous infusion:-

Shading of the spectrum began at 1264. in the green, gradually increasing in intensity as it extended towards the right until it became quite dark, and remaining so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Spirituous infusion containing about

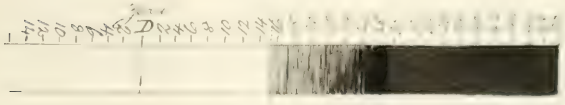
the spectrum appears nearly the same as under the above as used.

Emblica sack

(a Euphorbiaceous plant)

Darjeeling.

Aqueous infusion —



Shading of the spectrum began at 1542 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark, remaining so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing alum —

The spectrum appears exactly the same as when no alum is used.

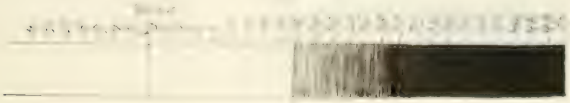
Gossypium Indicum

(Flowers)

Cotton flowers

Hyderabad

Aqueous infusion :—



Reading of the spectrum begins at 1·5 on the pure yellow increasing in intensity as it extended towards the right until it became quite dark, remaining so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

Aqueous infusion containing alum:-

The spectrum appears [illegible]

Thorea robusta.

(Bark)

[redacted]

[redacted]

[redacted]

Shading of the spectrum began at 1400 in the green gradually increasing in intensity as it extended towards the right until the darkness was complete.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

[redacted]

The spectrum appears exactly the same as when the solution was used except that the light portion is somewhat obscured by a slight opacity in the suspension

Bokal-bark.

Solid extract

Aqueous infusion —

Reading the spectrum open at 12mm — the green gradually increasing in intensity as it nears and covers the right portion of the spectrum — the blue portion dark and increasing so as to absorb nearly all the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations of the extent and intensity of the shading.

Aqueous infusion containing alum —

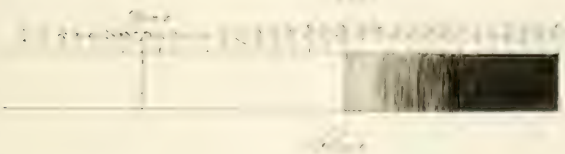
The effect is exactly the same as in the case of the

Strychnos nux vomica

(nux)

Ceylon, Madras Presidency, south Kanara, northern part of the Bengal Presidency, Nias, Nicobars, Pegu.

Aqueous infusion:



Shading of the violet begins at 2437 in the blue, gradually increasing in intensity as it extended towards the right until it became quite dark and remained so to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light [illegible] had no [illegible] on the extent [illegible] of the shading.

Aqueous infusion containing alum. The spectrum appears the same as when no alum is used.

Oldenlandia umbellata.

(Root)

Dry red plant

Southern India. Commercial

on page 13

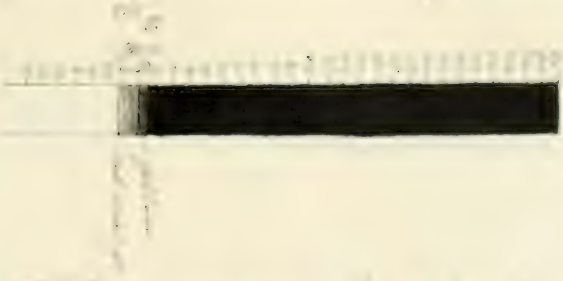
Specimen with Rubia umbellata, page 13. The spectrum does not correspond to the spectrum of the specimen in pharmacy of the Royal Gardens, Kew. The root may easily be made to yield a whole series of colours and probably the spectrum is as much different from that which would be obtained with the freshly gathered root, which forms a vital dye in the Punjaub and Bengal, as that of Indigo.

Crocus sativus saffron
(Mad)

Japan and
Bengal

Continued from page 183

other unidentified species
sometimes cultivated under -



Shading of the specimen began
at 130 on the red range practically
simultaneously on both sides and
extended towards the right until
it reached 93 on the yellow where
it became quite dark. The width
of the specimen in the region of
this band was completely obscured
while to the right of 130 on the
red range transmission gradually
brighter

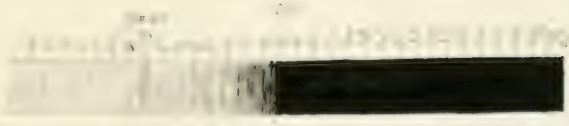
Continued on following page

Causalgia after gun shot wound

Wrist joint

Excised from forearm

Specimen — forearm containing gun shot wound.



The whole of the specimen to the right of this on the page was previously observed and the whole of the specimen to the right of this point was similarly observed.

Examination of the abdomen of the dog of Legion showed that which the light is transmitted Causes contraction of the vessels and withdrawal of both the light and the hand shading

---

Continued on following page

Crocus sativus saffron

(Wood)

Japan wood

Bengal

Continued from preceding page

aqueous infusion containing chloride of tin.

Chloride of tin forms a precipitate on the liquid and through the liquid — the coloration only and rays are transmitted

When the liquid is diluted, however the color enhance bands to show absorption, those to the left increasing and more until left absorbed, and those to the right increasing the infusion to be extremely dilute before they can be seen

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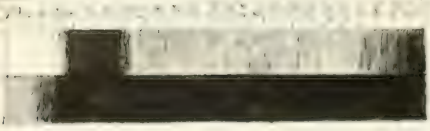
Continued on following page

Caesalpinia sapban
(Wood.)

Sapan Wood

Bengal

Continued from preceding page



The first of these two spectra was obtained by using a very dilute aqueous solution and the second by using a more concentrated aqueous solution.

The addition of hydrochloric acid to the aqueous infusion therefore does not alter the appearance or character of the spectrum obtained. The first band under the second spectrum extends into the red of the two spectra on this page

Bombax heptaphyllum

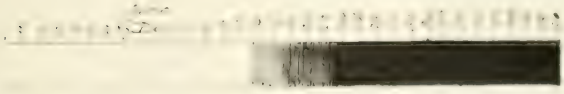
(Gum)

Red Cotton tree

The gum is termed Moochie Ras

Southern India Bombay Presidency

S. W. Coast United Kingdom



Fading of the spectrum began at 1374 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark, remaining so to the end of the spectrum

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

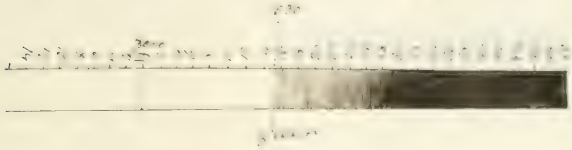
Aqueous infusion containing alum:

The spectrum appears exactly the same as when no alum is used.

Parmelia Lambertiana.

(A lichen)

Found on the Sikkim Himalayas, gathered in the Himalayas



Shading of the spectrum began at 1530 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark, and then it remained dark to the violet end of the spectrum.

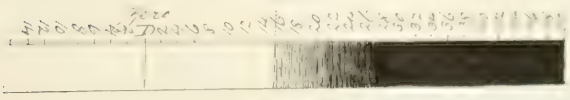
Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shad

Tagetes erecta

(Flowers)

Herba

Aqueous infusion:—



Shading of the spectrum began at 15/6 in the green gradually increasing in intensity as it extended towards the violet until it became quite dark and remaining dark to the end of the spectrum

Variations of the strength of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

Aqueous infusion contains no alkaloid

The spectrum appears exactly the same as when the alcohol is used

c Mangifera Indica.

(Pulp of fruit)

c Alcohol

(Conc.)

c Aqueous infusion:-

[redacted]

Shading of the spectrum to go at 1419 in the green gradually increasing in intensity as it extended towards the right until it became quite dark and then remained so to the end of the spectrum.

Variation of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading.

---

c Aqueous infusion containing alum.

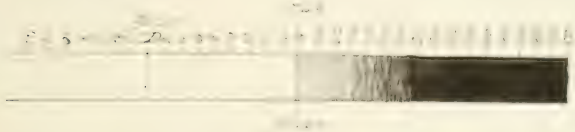
The spectra appear exactly the same as when no alum is used

Grewia oppositifolia

(Leaves)

Kherce Pass, the Khera Dhar
Sutlej valley between Rampur and
Chinguam -

a Grewia infusion -



Shading of the spectrum began
at 1748 in the green, gradually
increasing in intensity as it
extended towards the right, until
it became quite dark after which
no more of the spectrum was
visible in this direction

Variations in the thickness of
the layer of liquid through which
the light is transmitted cause
variations in the extent and
intensity of the shading.

A Grewia infusion containing alum

The spectrum has the same
character as when no alum is
used though the shading seems to
extend a little further towards the
left + to be a little more intense.

Oryza sativa.

(Kunth)

Rice

Indica

The specimens do not
contain any reference to
cultivated with [illegible]
of any portion of the plant.

It cannot [illegible]
Khanya in Kumaon area
as the roots and whole
grasses consumed as well
and instead only a decorated
[illegible] is used

Terminalia chebula

(Bark)

All parts of India.

Aqueous infusion -

[redacted]

Shading of the spectrum began at the red end, gradually increasing in intensity as it extended towards the right until it became quite dark after which the spectrum was completely obscured in this direction.

Variations of the thickness of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading

---

Aqueous infusion containing alum:

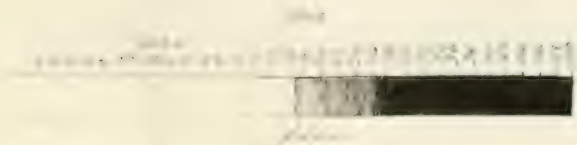
The spectrum appears exactly the same as when no alum is used

Ficus religiosa

(Bark)

"Pipal" or "Pechul" tree.

Most of the countries of the S. E. of Asia.



Shading of the spectrum began at 1140 in the green, gradually increasing in intensity as it extended towards the right until it became quite dark, after which no more of the spectrum was visible to the eye.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

The spectrum appears exactly the same as when an alum is used.

Phyllanthus emblica

Leaves

Southern Rhodesia (Country)

[redacted]

Reading of the spectrum by ...
... decrease in intensity as it
extended towards the violet
end till it became quite dark
and then remained dark to
the end of the spectrum.

Variations of the thickness
of the layer of liquid through
which the light is transmitted
cause variations in the extent
and intensity of the shading.

Aqueous infusion containing ...

The absorption spectrum cannot
well be examined as when used
other mordants[1] forms ... is
in the ...

Mangifera Indica

(Linn.)

Mango tree

Cook

Specimen examined

[redacted]

Flowers in the specimen dispersed in the green granularly terminating on axillary or at extended terminal stalk, eight inches or more in length stalk after ovulation of the petals and tender towards the apex

Calyx of the flower of the size of the corolla of equal shape and length with the corolla in flower and in fruit persistent

Stamens inserted on the receptacle

Filaments of the stamens on the outer side of the base of the petals

Anthers

Ovary

Cedrela toona

(Roxb.)

Himalaya, Bengal, Assam.

Specimen examined

[redacted]

Flowering at the extremities of the branches in panicles. Calyx small, 5-toothed. Corolla white, 5-petalled. Stamens 5, inserted on the base of the disk. Ovary 5-celled, with several ovules in each cell. Style short, thick. Stigma 5-lobed.

Capsule oblong, 5-celled, 5-valved, many-seeded. Seeds winged at both ends.

Specimen examined: Cultivated, Calcutta.

The specimen agrees with the description and with the figure in Roxb. Fl. Ind.

Fentilage Madreporaria
(Hard)

Astraea

Alcoholic specimen

Shading of the specimen upon it as in the red gradually increasing in intensity until they soon becoming quite dark and remained quite dark to the violet end of the spectrum.

With a monochromatic concentrated light on only red rays are transmitted and the specimen therefore reacts like that described (see page)

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading.

c. Amygdalus Persica

(Peach)

Peach tree

Himalayan Province, the Punjab, Kashmir, Abbottabad, Murree, Simla, Kulu, Ajmer, Bengal etc.

Equatorial plane

[redacted]

The leaves of the peach tree are alternate, petiolate, lanceolate, serrate, glabrous, and have a distinct midrib. The flowers are solitary, axillary, and pink in color. The fruit is a drupe with a fleshy mesocarp and a hard endocarp enclosing the seed.

The flowers are bisexual, actinomorphic, and have five petals, five sepals, numerous stamens, and a single pistil. The ovary is superior and contains two ovules.

Makoli

(Bark)

Sixth Test

Aqueous infusion.

Shading of the spectrum begins at 1484 in the green gradually increasing in intensity as it extended towards the right until it became quite dark after which no more of the spectrum was visible towards the violet end.

Reduction of the thickness of the layer of liquid through which the light is transmitted caused a diminution in the extent and intensity of the shading.

Aqueous infusion with acetic acid—

The character of the spectrum is the same as when no addition is made.

Amaranthus retroflexus

(Linn.)

Hab. [illegible]

Specimen examined:—

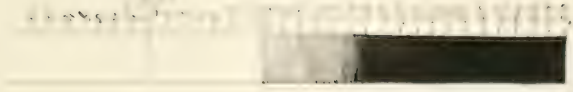
[illegible]

[illegible]

Specimens examined containing

alumen:—

[illegible]

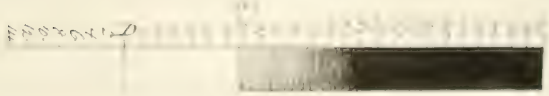


Deeds of

Land

Recorded

Specimens impressions



Stamping of the Specimens

of wax on the paper gradually

increasing on it towards

extended towards the right

until it [illegible] the

after which the [illegible]

was visible towards the left

end

Varieties of the Shell in

of the [illegible] which the [illegible]

Specimens impressions [illegible]

adhesive

The Shells of the Specimens on

the [illegible] are shown as

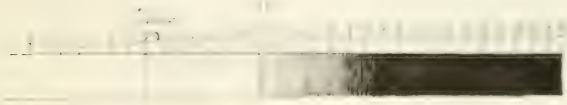
used.

Areca catechu,

(Betel)

Catechu palm.

Malabar, North Bengal, Nepaul, S. W. coast of Ceylon.



Shading of the spectrum began at 1326 in the green gradually increasing in intensity as it extended towards the right until it became quite dark after which no more of the spectrum was visible to the violet end.

Variations in the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shade of

Cochineal

Coccus cacti

Hymenoptera

Continued from page 2

a Specimen of Cochineal mounted with sulphuric acid:

Shading of the specimen Figure at 2/3 on the red image gradually increasing its intensity as it extended towards the right until it became quite black at 1/3 on the yellow spot which formed one end of the specimen which towards the right

Considering the thickness of the layer of liquid through which the light is transmitted in the various parts of the whole mass of the specimen

Continued on following page

[redacted]

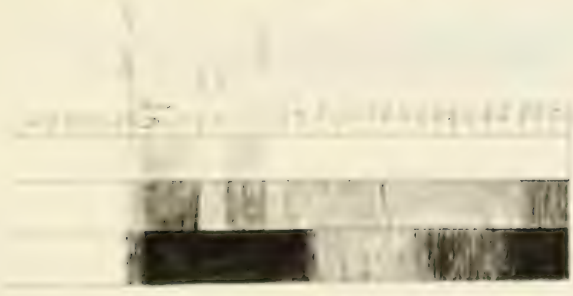
[illegible]

[illegible]

[illegible]

[illegible] on preceding page

[illegible] on preceding page



[illegible]

[illegible] on following page

Continued

Circuit court

of [redacted]

Continued from preceding page

of [redacted] and with

[redacted]

[redacted]

the [redacted] of the [redacted] to
the right of [redacted] on the [redacted]
[redacted] and the [redacted]
of the [redacted] to the right of
the [redacted] and [redacted]
[redacted] of the [redacted] of
the [redacted] of [redacted] with
[redacted] the [redacted]
[redacted] and the [redacted]
and [redacted] of both the [redacted]
and the [redacted]

Continued on following page

Geological.

Coccus cacti

Myers

Continued from foregoing page

[redacted]

Shading of the spectrum begins at the yellow gradually increasing in intensity as it extends towards the right until at the yellow green right behind the centre of the spectrum when merges towards the right

Transference of the shade over the larger of Grand through behind the light is transmitted through gas flames on the shade of the shading

Hemingia conjugata.

Hk. var.

Khasiana

Habitat information:

[redacted]

for

shading of the specimens began at node on the green, gradually increasing in intensity as it extended towards the right until at branch point about, most other specimens of the species were exactly towards the right

Examination of the distribution of the stages of legend through out the slight is summarized Cursor examination on the actual and intensity of the shading

Cucurbitaceae tinctoria.

(Coloquinte extract)

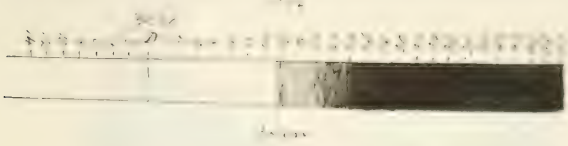
Grows in great abundance all over India.

The medical part is used and in the pulpy portion of the fruit with a general knowledge of the fruit to the right of this head.

The red orange & yellow are quite bright

Quercitron bark

Spectrum of bark.



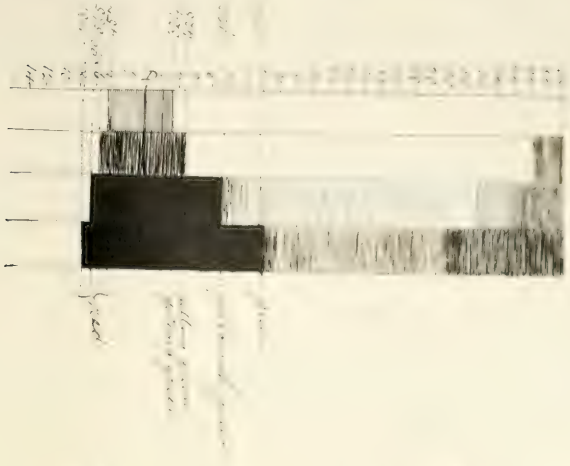
Shading of the spectrum begins at 1542 in the green gradually increasing in intensity as it extended towards the violet until it became quite black after which no trace of the spectrum could be observed in that direction.

Description of the absorption of the rays of light by solution of bark. Curves representing the nature and intensity of the absorption.

Spectrum of bark containing alum. The absorption of the spectrum is nearly the same as when no alum is present.

Litmus.

Aqueous solution.



Similar spectra are obtained by using successively more concentrated solutions with a very distinct absorption faint shading is observable on the red side of D. When the solution is more concentrated the band increases in width and intensity while the violet of the spectrum to the right of it becomes somewhat obscured but the extreme red remains bright

---

Neutral litmus simply shows the right hand portion of the spectrum

Weld

Reseda luteola

Aqueous infusion:

1 in

[redacted]

Shading of the spectrum began at 1620 in the green, gradually increasing in intensity as it extended towards the right until it became quite [illegible] and remaining dark to the end of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent and intensity of the shading

---

Aqueous infusion containing alum

A considerable precipitate is caused by the addition of alum so it is therefore not possible to examine the absorption spectrum with this addition.

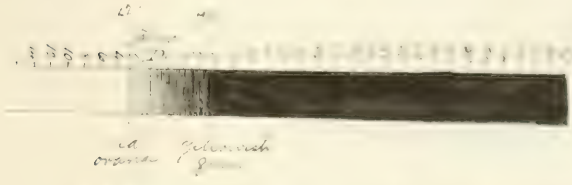
Coccus ilicis

Kermes

Several parts of Asia and the South of Europe.

Linnaeus Hemiptera

Aphidoidea



Shading of the spectrum began at 229 in the red & was gradually increasing in intensity as it extended towards the right until it became complete at 531 in the yellow just after the black spirit. The remainder of the spectrum was visible towards the right

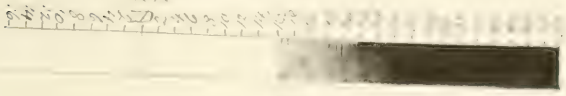
Variation of the shading of the layer of liquid through which the light is transmitted causes variations in the extent and intensity of the shading.

Continued on following page

Crocus iliacis.

Crocus.

Aqueous infusion



Shading of the spectrum began at 1621 on the green gradually increasing in intensity as it extended towards the right until it became quite dark, after which no more of the spectrum was visible in this direction.

Variations of the thickness of the layer of liquid through which the light is transmitted cause variations in the extent & intensity of the shading

Coccus Cacti.

Terms.

Found [illegible] in Mexico and the South of Europe

Cochineal [illegible] Portugal

Cochineal [illegible] of

a Green [illegible] with

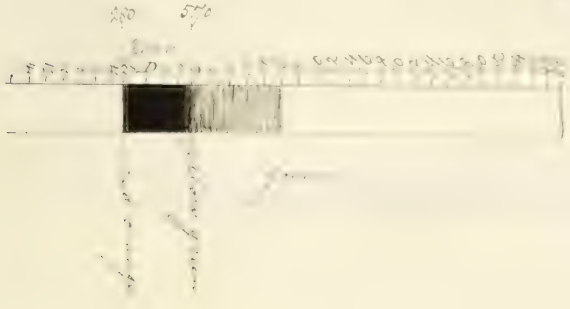
alkalies with water.

These four absorption spectra are obtained by using successively thicker layers of the [illegible] solution, the first being bounded by the thinnest layer and the last by the thickest layer.

Rocella tinctoria

Commercial orchil.

The liquid commercial orchil was diluted with water and filtered.



A dark band extended from 2.80 in the red orange to 5.70 in the yellow green and from the latter point a faint shading extended to about the middle of the green portion of the spectrum.

Variations of the thickness of the layer of liquid through which the light is transmitted caused variations in the width and intensity of the dark band, but the layer of liquid may be so thick that the whole of the spectrum to the right of D is obscured and still the red extremity bright

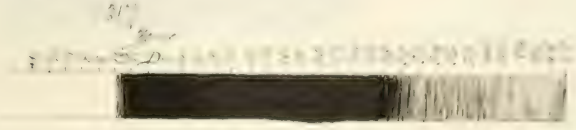
Continued on following page

Rocella tinctoria

(Commercial orchil)

Continued from preceding page.

The liquid commercial orchil was diluted with water and filtered.



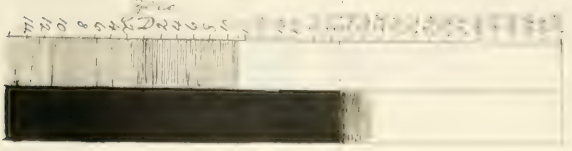
When the spectrum a very thick layer of liquid was used By comparing it with the spectrum on the preceding page it will be seen that, although the dark band is extended so far to the right as to obscure the whole spectrum on that direction of the only extended very slightly towards the left, leaving the end practically bright.

The reaction is not changed in character by the addition of soda solution to the liquid, but the band is quite destroyed by acids or alum and the spectrum is light towards the left and dark towards the right

Patent night blue

Schott Jenner & Co.

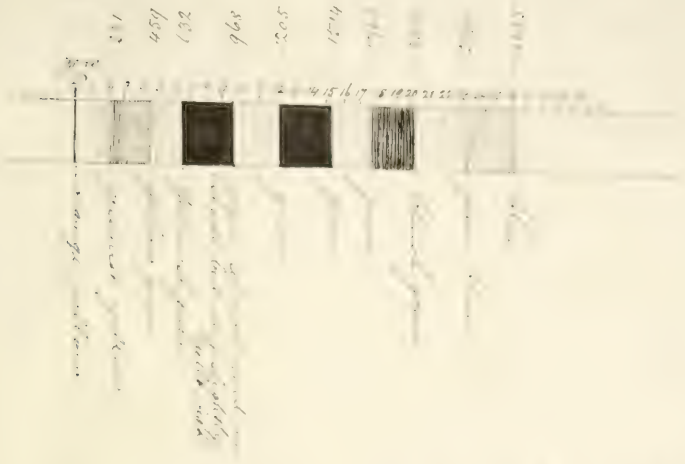
Aqueous solution.



Absorption spectrum No. 1 of a
1:1000 solution was used. A light
shading extended from the red
to 1103 in the green. The
remainder of the spectrum was
bright

Absorption spectrum No. 2 of
a 1:500 solution was used. The
spectrum was quite dark from the
red to 1131 in the green blue
where it began to grow light and
then after the D lines gradually
light to the violet.

Permanganate of potash



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